I. *An Anatomical Deſcription of the Heart of Land Tortoiſes from* America. *By Mr.* Paul Buſſiere, *Surgeon, F. R. S.*

IN the Deſcription that I give of the Heart of theſe Animals, I have in no wiſe any deſign to criticiſe upon what Mr. *Mery* hath publiſhed in the Memoirs of the Royal Academy of Sciences, *Anno* 1703. but leave it to the Determination of the Publick. I never was a friend to Diſputation, it contributing oftentimes more to intangle the Subjects that are treated, than to explain the Veracity of the Facts that are ſearched after; and I had entirely abandoned this, which hath been ſome Years between Mr. *Mery* and myſelf, concerning the Uſe of the *Valves*, which cover the *Foramen Ovale* in the Heart of an Human *Fœtus*, if Mr. *Mery* had not pretended to maintain his Opinion by the compariſon of the pretended *Valves*, which he imagines to be in the Heart of the Land Tortoiſes of *America*, (apparently that he hath invented them himſelf) in the pretended *Ventricles* of the Heart of that Animal; and if at the ſame time three Commiſſaries of Reputation deputed by that Academy, had not given an Authentick Approbation to what is advanced by that Anatomiſt. This ſort of Authority might impoſe on the Publick, the greateſt part whereof believe every thing upon ſuch teſtimony, and the others remain in ſuſpenſe for want of the neceſſary means to inform themſelves of the truth; the Land Tortoiſes of *America* being very rare in *Europe*, and the greateſt part of Anatomiſts wanting either the Means or Conveniencies to get them. I have

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have then Reaſon to hope, that thoſe who concern themſelves in theſe Matters, will not diſapprove the Care I have taken to have ſome brought from *America*; and to let them know the Structure of the Heart of this Animal, which, of all that might have been choſen, is the moſt proper to convince Mr. *Mery* of his miſtake, and confirm the uſe of the *Valve* of the *Foramen Ovale* in the Heart of an Human *Fœtus*, eſtabliſh'd firſt by Dr. *Harvey*, and confirmed and demonſtrated by all Anatomiſts ſince his time. The Structure of the Heart of this Animal being very ſimple, and the uſe of the double *Valve*, which covers the two *Foramina* of the *Auricle*, in the *Sole Ventricule* of the Heart, ſo plain and ſo manifeſt, that 'tis not poſſible to miſtake, as it will be acknowledg'd by the Deſcription of its Parts and its principal Veſſels. I diſſected three ſucceſſively of the five I received from *Jamaica* in *September* laſt, being yet alive, in the Preſence of Dr. *Sloane*, Dr. *Sylveſtre*, Mr. *Pujolas*, and Mr. *Laſage*, an able Surgeon of *London*; all being occular Witneſſes of what I aſſert. The other two being dead by that time, I cauſed their Hearts to be taken out entire; one of which I ſent to be diſſected in *Paris*, and I kept the other to ſatisfy the Curioſity of thoſe who will ſee it.

A Deſcription of the Heart of a Land Tortoiſe *of* America.

The Heart in this Animal is ſituated in the *anterior* part of the capacity that maketh the *Abdomen*, ſeparated from all the other *Viſcera* by a large *Pericardium*, which encloſeth it. This *Pericardium* is faſtned by its *ſuperior* part to the Spine of the Back, by the *anterior* to the Muſcles of the Neck; which is the cauſe that the Heart moveth forward when the Animal putteth forth his Head out of the Shell, and backward when he draws it in: By the *Inferior* part it adheres to the *Peritoneum*, which is faſtned to the lower Shell; ſo that by all theſe Ligaments the *Pericardium* is kept diſtended ſufficiently, that the Heart hath an entire liberty in it.

In this *Pericardium* there is found a good quantity of a very clear and tranſparent Water, which hath the ſame uſe there, as that which is found in the *Pericardium* of other Animals.

'Tis in the middle of this *Pericardium* that the Heart is ſuſpended; to wit, at its *Baſis* by the Arteries, and at its Inferior part by a little Tendon, or a very thin Ligament, which from the Point or Cone of the Heart, aſcendeth to inſert it ſelf to that part of the *Pericardium* which adheres to the Back.

This little Ligament is very remarkable in this, that by its means the Point of the Heart is ſuſpended on the Level of its *Baſis*; without which 'tis viſible that the Point of the Heart would fall lower, and bend the Veſſels of the *Baſis*, which might have interrupted the free Circulation of the Blood, and by conſequence would have endanger'd the Life of the Animal.

The *Pericardium* being opened, the Heart appeareth as if it was ſtanding by itſelf, being only fix'd to the Arteries which go out of it (ſuppoſing the Animal turned upon its Back) its *Auricles* being ſeparated and hid under its *Baſis* and Arteries, towards the Back of the Animal; which is very different from the Sea Tortoiſes, where the *Auricles* are ſituated on the Right and Left Angle of its *Baſis*, by which way they puſh the Blood into the Heart.

The Figure of the Heart of this Animal is almoſt lenticular; making nevertheleſs three obtuſe Angles, two on the *Baſis*, one to the Right, and the other to the Left; the third is at the Inferior part, where the little Tendon, which ſuſpendeth the Heart on the Level of its *Baſis*, is inſerted.

If this Animal be opened alive, you have the ſatisfaction to ſee the Circulation of the Blood, by reaſon of the tranſparency of the Membranes of the Veins, and the Alternative Motions, or Dilatations of the Heart and Auricles, and the Arteries and Veins, which are very ſlow in this Animal.

From the *Baſis* of the Heart paſs out four great Arteries, that appear diſtinctly ſeparated one from the other; whereas in that of the Sea Tortoiſe, theſe Arteries are involved, for the length of an Inch, in a *capſula* common to them all, which maketh them to appear as if they were but one Trunk. If theſe four Arteries be entirely cut, the Heart is no more ſuſpended, but by the conjunction of the two *muſculous Conduits* of the *Auricles*, which pierce the Heart in its *poſterior* part, towards the middle of the Heart, on the Left ſide; by which the Blood runneth from the Auricles into the *Ventricle* of the Heart.

Theſe Arteries being thus divided, and the Heart turned over, the *Auricles* appear lying tranſverſely againſt the Back, in the capacity of the *Pericardium*: They make but one continued fleſhy Body, a little extended, about two thirds inclining to the Left ſide. 'Tis in this Body that the Cavities of the *Auricles* are ſeparated the one from the other, by a *muſcular Septum*, ſituated Internally to that Place, which appears contracted Externally. Theſe *Auricles* make a *muſcular* Production about ſix Lines long, which uniteth them to the Heart, towards the middle and left of its backſide. This Production is compoſed of two Conduits, ſeparated only from one another by the Extenſion of the *Septum*, which divideth the two Auricles: It is by theſe two Conduits that the Blood floweth from the Auricles into the Heart. The Body of theſe *Auricles* hath no adherence to the *Pericardium*, nor any ſupport but that of the Veins, which end in it; for if you divide theſe

Veins, the Heart and *Auricles* comes out of the Body; and then if you ſuſpend the Heart by the *Auricles*, they reſemble two Funnels joyned together, the little end of which opens into the *Ventricle* of the Heart, to pour the Blood into it: And 'tis in this manner we are to conceive them, in the Natural Situation of the Animal.

After having thus conſidered the External Parts of the Heart and its *Auricles*, we are to proceed to the Examination of the inſide of both of them. In order to that, it muſt be opened at its Inferior Surface, (ſuppoſing the Animal turned upon its Back) becauſe all the Orifices of either the Arteries and Veins, and their *Valves*, are in the oppoſite ſide: Therefore a Probe may be introduced through one of the Arteries into the Heart, and it opened upon it; after that, you cut all this ſide round about the Inferior Circumference, from one Angle to the other, and then turn over all that part which is cut on the *Baſis* of the Heart: For then it is eaſy to remark and view all the Internal Parts of an Heart, and obſerve that there is but one ſole *Ventricle*, which comprehends the whole extent of the Heart, and is as uniform and plain as either of the *Ventricles* of the Human Heart, or of any other Animal whatſoever; and that it is impoſſible to remark any kind of *Septum*, either Muſculous or Membranous, that might make any Diviſion or *Cellule* in this *Ventricule*: And 'tis very ſurprizing, that the Anatomiſts of the Royal Academy of *Paris* have ſhewn, the one three, and the other four *Ventricles*, in the Heart of a Land Tortoiſe of *America*. I confeſs this Difficulty is to me and the Gentlemen who have ſeen them diſſected, a Myſtery, which theſe Anatomiſts and their Approvers will diſcover to us when they ſhall think fit.

After having conſidered the extent of the Cavity of the Heart, there remain two things to be examined. The firſt is, that in its back-part there are five Holes or Orifices, two whereof are on the Left Side: Theſe are the Orifices of the two Funnels of the *Auricles*: They are covered by a large *Valve* lying flat upon them, ſupported in its middle by the Prolongation of the *Septum*, which divides the *Auricles*, in ſuch a manner, that half of it covers the Orifice of the Right *Auricle*, and the other half that of the Left; ſo that this *Valve* reſembles two folding Doors of a Porch, which have the ſame ſupport, and whereof one opens or ſhuts to the Right, and the other to the Left. It is viſible, that this *Valve* permits the Entrance of the Blood into the *Ventricle* of the Heart, but oppoſes its return into the *Auricles*; becauſe this Blood being once in the Heart, preſſes by its own weight upon this double *Valve*, and keeps it cloſe and flat upon theſe Orifices: Which confirms perfectly well the Office of the *Valve*, which is in the *Foramen Ovale* in the Heart of an Human *Fœtus*, the Diſpoſition being entirely the ſame. The other three Holes lying on the Right ſide of the *Ventricle* of the Heart, are the Orifices of the four Arteries which come out of the *Baſis*: Of theſe three Holes, that which is the moſt Left is the Orifice of the Pulmonary Artery; that which is the higheſt, is the Orifice of the *Aorta ſiniſtra deſcendens*; and that which is the moſt to the Right ſide, is common to the *Arteria Aorta dextra*, and to the *ſuperior Aorta*. Each of theſe Orifices is furniſhed with two Semilunary *Valves*, which permit the Blood to paſs without difficulty from the *Ventricle* of the Heart into the Arteries, but hinder its return into the Heart. 'Tis a pure Illuſion, to place theſe Holes in different *Ventricles*; they are all in one and the ſame Cavity; ſo that the Blood enters into this only Cavity, by the two Holes which are on the Left

Side, and goes out of this ſame *Ventricle*, by the three Holes which are on the Right Side.

The ſecond thing remarkable in this Ventricle is the Fibres of the Heart. They are of two ſorts; ſome are External, diſpoſed under the common Membrane in ſeveral Plans, very ſmall, but obliquely circular, extending from the *Baſis*, but particularly about the Arteries, which ſerve them inſtead of Tendons or Points of ſupport, towards the Inferior Circumference of the Heart: The other Muſculous Fibres which compoſe the Heart, are in the manner of ſeveral Columns, as thoſe of the Human Heart; they are ſituated Internally in both ſides, lying obliquely from the Right, where their Tendons are about the Arteries, to the Left; which demonſtrates that their action is from the Left to the Right Side, where the Orifices of the Arteries lye open, to let the Blood paſs out.

It has been ſaid before, that the two *Auricles* of the Heart of the Land Tortoiſe of *America*, make Externally but one continued Body; but that it has Internally two Cavities, ſeparated from one another by a Muſculous *Septum*. This *Septum* ſeparates them ſo exactly, that there is not the leaſt Communication of the one with the other; ſo that the Blood of either *Auricle* does not mix with that of the other, but in the Ventricle of the Heart. The Right Auricle is as big again as the Left; all the Blood of the Animal (that of the Lungs excepted) paſſing through it to go into the Heart; the Left Auricle receiving only the Blood which cometh from the Lungs, the Pulmonary Veins being very ſmall. The Internal Part, of the *Auricles* are furniſhed with little Muſculous Columns, but particularly at their Extremities, ſituated in ſuch a manner, that it is viſible their action tends to puſh the Blood againſt the *Septum*, where the Conduits, which convey it into the Heart, are ſituated.

There is in the bottom of the Right Auricle an oblong Orifice, by which the Blood cometh into its Cavity from the great Reſervoir of the Veins, ſituated on the back-part of the Heart. This Orifice is furniſhed with two Semilunar oblong *Valves*, diſpoſed in ſuch manner, that when the Auricle is relaxed, the Blood enters its Cavity, but when contracted, they ſhut cloſe to hinder the Blood from returning into the Veins: The Orifice of the Funnel, or the Conduit into the Heart, is to be ſeen againſt the *Septum*. The Left Auricle hath exactly the ſame Structure as the Right: 'Tis in the bottom of this Auricle, that the Orifice, common to the two Pulmonary Veins, is to be obſerved, furniſhed with two Semilunar *Valves*; and againſt the *Septum* to the Right, that the Funnel or Conduit into the Heart is ſituated, joining with the Funnel of the Right Auricle. Theſe two Conduits are ſeparated from one another by the continuation of the *Septum*, which divides the Auricles to the very *Ventricule* of the Heart, and is as a ſupport to the middle of the double *Valve* which covers their Orifices in the Heart.

Of the Veſſels of the Heart.

IT has been ſaid before, that from the *Baſis* of the Heart of the Land Tortoiſe of *America*, there goes out four great Arteries. Of theſe, the firſt which preſents itſelf, (the Tortoiſe being turned upon his Back) is the Pulmonary Artery: It is more on the Left Side than the others, and is much bigger for the ſpace of an Inch; then it divides itſelf into two Branches, the moſt apparent whereof cometh from the Right Side of its Trunk, and turns itſelf over towards the Left Side, accompanying the *Aorta inferior ſiniſtra*, till it hath pierced the *Pericardium*; after that it unites with the Left Branch of the *Trachea Arteria*, which it accompanies

through

through all the Extent of the Left Lobe of the Lungs. The other Pulmonary Branch going out of the Left ſide of its Trunk, turns itſelf over immediately croſs upon the other Arteries, from the Right to the Left, to joyn the *Aorta Inferior dextra*, till it has pierced the *Pericardium*, where it joyns to the Right Branch of the *Trachea Arteria*, which it accompanies through the whole extent of the Right Lobe of the Lungs.

One thing ſeems to me very remarkable in this Pulmonary Artery; it is this, that though its Trunk, in going out of the Heart, hath more than twice the Diameter of the *Arteria Aorta ſiniſtra*, yet the two Branches which it ſends to the Lungs, have not either of them one third of the Diameter of the *Aorta ſiniſtra.* In the Arteries, which I have fill'd with Wax, the Trunk of the Pulmonary Artery hath between ſeven and eight Lines Diameter; the *Aorta ſiniſtra* four and a half; and the Pulmonary Branches, after having pierced the *Pericardium*, have not either of them but one Line and a half Diameter: Nevertheleſs this Artery doth not produce any other Branch; all the Blood, which enters from the Heart into its Trunk, is carried into the two Lobes of the Lungs, and no where elſe. The reaſon of ſuch diſproportion I cannot gueſs; but this is matter of Fact, ſince it is the ſame in all: Nevertheleſs, if I may be permitted to conjecture, it ſeems to me that it may be attributed to the alteration that happens to the Branches of the *Trachea Arteria*, when the Tortoiſe ſtretcheth forth his Head out of the Shell; for theſe Pulmonary Branches making an half Circle before they joyn with the *Trachea Arteria*, when the Animals Head is drawn in, the Extenſion which happens to the Branches of the *Trachea Arteria* when the Animal goes out of the Shell, turns theſe half Circles into ſharp Angles; inſomuch, that thereby the Paſſage of the Blood is ſomewhat Interrupted, and conſequently the Blood, which paſſes continually from the Heart into the Trunk, not being capable to return back, becauſe of its Valves, muſt out of neceſſity dilate this Trunk more than the other Arteries, in which the Blood paſſes in an equal Paſſage.

And that which perſwades me that there doth not go into the Lungs of this Animal, more Blood than that quantity which the Pulmonary Branches can admit by their ſmall Diameter, and not the quantity which the Diameter of their Trunk could furniſh, is, that the Pulmonary Veins, which bring back all the Blood of the Lungs into the Left Auricle of the Heart, have not either of them entirely two Lines Diameter, which is very proportionable to the bigneſs of the two Pulmonary Branches of the Arteries.

The ſecond Artery which goes out from the *Baſis* of the Heart, is that which I call *Aorta ſiniſtra*: It aſcends, as it comes out of the Heart, together with the Left Pulmonary, till they have pierced the *Pericardium*; after which it makes a large turning, without any ſupport, towards the Left Side, which gives it the liberty to extend itſelf when the Animal ſtretches out of its Shell, and to refold itſelf when it retires into it; after that, this Artery deſcends againſt the Back, where it gives ſome ſmall Branches to the *Medulla Spinalis*; after that, it returns through the Lungs into the *Abdomen*, and it is here that it produceth a conſiderable Branch, which divides into two, of which one is diſtributed to the Liver, the Stomach, and the Inteſtines, and the other turning towards the Right in the middle of the *Abdomen*, unites to the *Aorta dextra*; ſo that theſe two Arteries are but one and the ſame Branch divided into two. This ſame *Aorta ſiniſtra* continues afterwards to the lower Belly, to be diſtributed to the Kidneys, Thighs, and the Parts that are below. This Left *Aorta* is much longer than the Right, becauſe of the great

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Circle it makes when it cometh out of the Heart, to accommodate itſelf to the motions of the Animal, and to make room for its Head, which is placed under this Artery in the Left Side, when he draws it into his Shell: And 'tis for that reaſon that the Left Branch of the *Trachea Arteria* is longer than the Right. This Artery is alſo bigger than the Right *Aorta*, becauſe that it furniſheth a greater number of Parts with Blood. It hath a diſtinct Orifice into the Ventricle of the Heart, and hath not the leaſt Communication with the Pulmonary Arteries, neither in the Heart nor in any other Part. This does not reſemble at all to the *Ductus Arterioſus*, or, as a certain Modern is pleaſed to call it, the Canal of Communication, in the Heart of an Human *Fœtus*.

The third Artery going out from the *Baſis* of the Heart of this Animal, is that which I call *Aorta deſcendens dextra*: After having pierced the *Pericardium* it ſinks towards the Back; then returning through the Lungs into the *Abdomen*, where it receives the Branch of the *Aorta ſiniſtra*, it is deſtributed to the Right Kidney, Thighs, Bladder, and Parts of Generation: So that I call theſe two Arteries, *Arteriæ Aortæ deſcendentes*, becauſe they diſtribute the Blood to all the Inferior Parts of this Animal, the ſame as the *Aorta deſcendens* doth in all other Animals.

The fourth Artery going out from the Heart, is the *Aorta aſcendens*. It hath an Orifice in the Ventricle of the Heart, common with the *Aorta deſcendens dextra*: It appears in part under the *Aorta ſiniſtra* coming out of the Heart, and aſcendeth in a ſtrait Line till it hath pierced the *Pericardium*; after which it divideth into three principal Branches, whereof the two lateral go to the fore Legs, and make the Carotid; the third aſcends all along the *Trachea Arteria* towards the *Larynx*, and gives Branches to all the Parts of the Neck.

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The Diſpoſition of the Arteries which go out of the Heart being examined, there remains only the Veins which bring the Blood into it from all the Parts of the Animal: But firſt one muſt obſerve, that there is no Veins which terminate in the Heart; for all the Veins open themſelves into the Auricles, which are, as hath been ſaid, ſeparated from the Heart.

There are two ways to ſhow theſe Veins without Diſſection: The firſt is to fill them with Wax, by Syringing it into them by their Orifices in the Auricles; for if one ſyringeth by the oblong Orifice in he *Auricula dextra*, all the Veins of the Body (except thoſe of the Lungs) will be entirely fill'd; and afterward by Syringing into the Oval Orifice in the *Auricula ſiniſtra*, the two Veins of the Lungs will be full at once thro' the whole extent of *Trachea Arteria* in the Lungs.

The other way is to wait till the Animal is expired; becauſe the Heart loſing inſenſibly its Vigour, (it beating for the ſpace of 24 hours,) it has not then the force to diſcharge itſelf of the Blood which comes from all Parts into theſe Veins, which then grow very turgid by the coagulated Blood collected in them: Then you need only to turn over the Heart towards the Neck, cutting only the little Cororary Vein which comes out of the Subſtance of the Heart, for to obſerve all the great Veins without Diſſection; becauſe they all come and end in a common Reſervatory, ſituated acroſs in the capacity of the *Pericardium*, joining to the Auricles. And here one may obſerve a great Vein, or an Irregular Reſervatory: In the Tortoiſes I have diſſected of 18 and 20 Inches long, this Reſervatory was 10 Inches broad, and 18 Inches long. In this Reſervatory the two Axillary Veins which come from the upper Parts of the Body, joyn one another, after having pierced the *Pericardium*, one on the Right ſide, and the other on the Left. From the Inferior Parts there joyn two large Veins, one on the Right ſide, and the other on the Left of the Inferior Part of this Reſervatory ; the firſt whereof is made up of all the Branches which come out of the Right Lobe of the Liver, which is very big ; and the other conſiſts not only of the Veins of the Left Lobe of the Liver, but alſo of a Vein which ſupplies the place of the *Vena Cava*, and which I call the *Vena Inteſtinalis*, becauſe after it has received all the Veins of the Inferior Parts of the Animal, it runs all along the Inteſtines, from which it receives the Veins ; and being arrived at the *Pylorus*, it paſſes croſs the Left Lobe of the Liver, and terminates in the common Reſervatory.

Beſides theſe four great Veins, there are three, and ſometimes but two, coming from the middle part of the Liver, which are inſerted into the bottom of the Reſervatory ; as alſo the little Coronary Vein from the Heart.

All theſe Veins being thus re-united in one common place, this Reſervatory terminates upwards in a Conduit, which is inſerted into the Poſterior Part of the Right Auricle, and opens into its cavity by an oblong Orifice, furniſhed with two long Semilunar Valves, which permit the Blood of the Reſervatory to enter into the Auricles, but hinder its returning from the Auricles into the Reſervatory.

A little above the Reſervatory, under the Left Auricle, the two Pulmonary Veins are ſeen : The Left, after having entered the *Pericardium*, is hid under the Axillary Vein, and does not ſeparate itſelf from it but a little above the Auricles ; from thence it bends to go and inſert itſelf into the Poſterior Part of the Auricles. The Right Pulmonary Vein follows after the ſame manner the Right Axillary, which it quits after it has entered the *Pericardium*, to traverſe almoſt all the length of the Reſervatory, and meet the Left Pulmonary about two Lines diſtance from the Auricles. Theſe two Veins thus united,

ted, open themſelves in the Poſterior Part of the *Auricula ſiniſtra*, by a common Oval Orifice furniſhed with two Semilunar Valves; by which means they pour into this Auricle all the Blood that comes from the Lungs to the Heart.

By all that has been obſerved concerning the Structure of the Heart of the Land Tortoiſe of *America*, and the Diſpoſition of both its Auricles and Veſſels, how extraordinary ſoever it may appear, it is impoſſible to find out the leaſt thing which may injure the Opinion of Dr. *Harvey*, and all other Anatomiſts, about the manner that the Blood Circulates in the Heart of an Human *Fœtus*, and the uſe of the Valve which is at the *Foramen Ovale*; which is, to permit the Blood to paſs from the Right Auricle through this Hole into the Left, and to hinder the Blood's paſſing from the Left Auricle by this Hole into the Right. And I add further, that amongſt all the known Animals, one could not chuſe one whoſe Heart may be more proper to confirm this Opinion, than the Land Tortoiſe of *America*, by reaſon of the ſimplicity of its Structure, and of the plain and diſtinct manner in which all the Parts appear. Therefore there is room to hope, that if Mr. *Mery* would give himſelf the trouble to examine a ſecond time the Structure of the Heart of this Animal, with that Honeſty and Candour he would make us believe he has, he will acknowledge his Miſtake and Errors: But if after that, he perſiſts ſtill in his Opinion, I have done with him; and ſhall leave him to enjoy peaceably the agreable ſatisfaction he takes in his Opinion, and ſhall not trouble my ſelf any farther, to convince him, or his Followers of their Error.

AN
Explication of the Figures.

TAB. I.

Fig. 1. a. a. a. *The Heart.*
b. b. b. *Its Auricles.*
c. *The Trunk of the Pulmonary Artery.*
d. *The* Arteria Aorta deſcendens ſiniſtra.
E. *The* Arteria Aorta ſuperior.
H. *The* Arteria Aorta deſcendens dextra.
F. *The Ligament that ſuſpendeth the Cone of the Heart in the* Pericardium.
G. G. G. G. G. *The* Pericardium *opened.*

Fig. 2. a. a. a. *The Heart opened to ſhow the Parts of its Ventricles.*
b. *The double Valve covering the Orifices of the* Ductus's *from the Auricles.*
c. *The Orifice of the Right Auricle* i.
d. *That of the Left* H.
e. *The Orifice of the* Arteria Pulmonalis *K.*
f. *That of the* Aorta ſiniſtra *L.*
g. *The Orifice common to both the* Arteria Aorta dextra *M. and the* Aorta ſuperior *N.*

Fig. 3. a. a. a. *The Auricles.*
b. *The Right Auricle.*
c. *The Left Auricle.*
d. d. *The Muſculous* Septum *that divides the Cavities of the Auricles.*
E. *The Orifice of the Reſervoir of the Veins.*
F. *The Orifice of the Pulmonary Veins.*

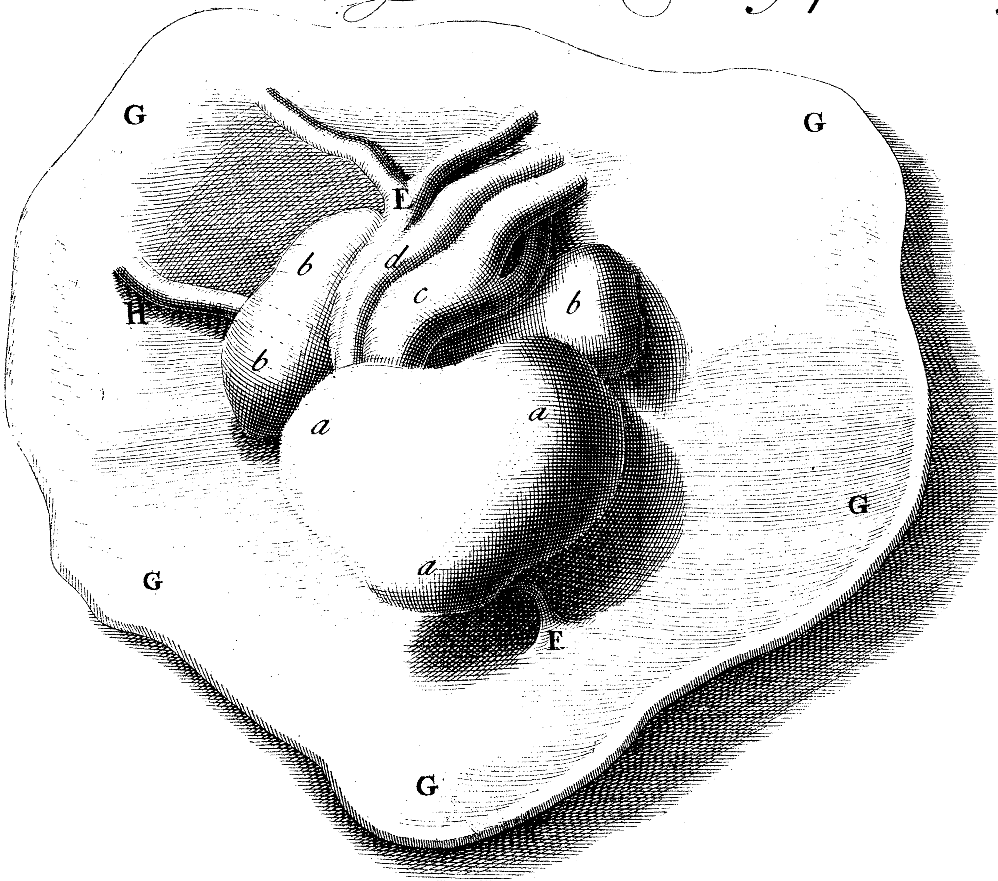
g. g. *The*

g. g. *The large Parts of the Funnels.*
H. *The Muſculous* Ductus *of the Funnels.*
i. i. *The Reſervoir of the Veins.*
K. *The Left Axillary Vein.*
L. *The Right Axillary Vein.*
M. *The great* Inteſtinal *Vein.*
N. *The great* Hepatic *Vein.*
o. o. *Two ſmall* Hepatic *Veins.*
P. *The Right Pulmonary Vein.*
q. *The Left Pulmonary Vein.*

Fig. 4. a. *The Heart of the Tortoiſe.*
b. *The Trunk of the* Arteria Pulmonalis.
c. c. c. &c. *The Branches of the* Arteria Pulmonalis, *accompanying the* Bronchia *in the Lungs.*
d. d. d. d. *The* Arteria Aorta deſcendens ſiniſtra.
e. e. e. e. Arteria Aorta deſcendens dextra.
f. f. *One Branch of the* Aorta ſiniſtra, *which communicates with the* Aorta dextra.
g. g. Arteria Inteſtinalis.
h. Arteria Aorta ſuperior, *or* aſcendens.
i. *The Ligament that ſuſpends the Heart.*
K. *The* Trachea Arteria.
L. L. L. L. *&c. The two Branches of the* Trachea Arteria *going to the Lungs.*

Philoſoph: Tranſact: N°

Fig: 1^{a}.



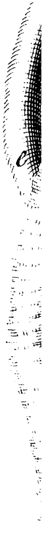
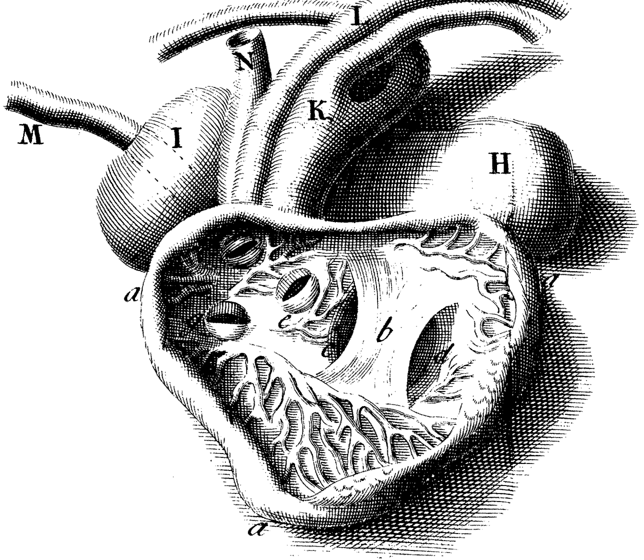


Fig: 2^{a}.



N° 328.

Fig: 3^{a}.

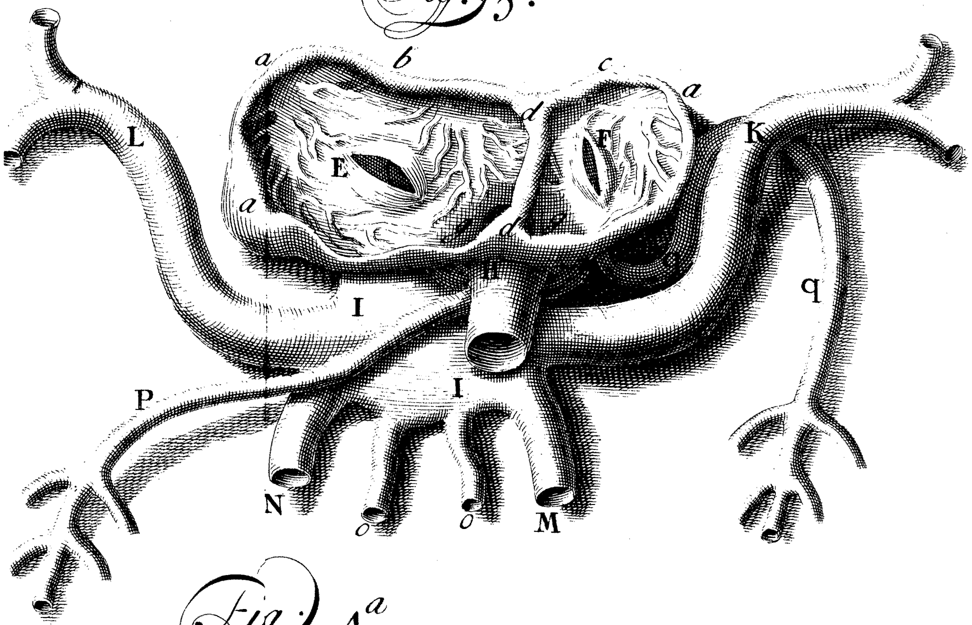
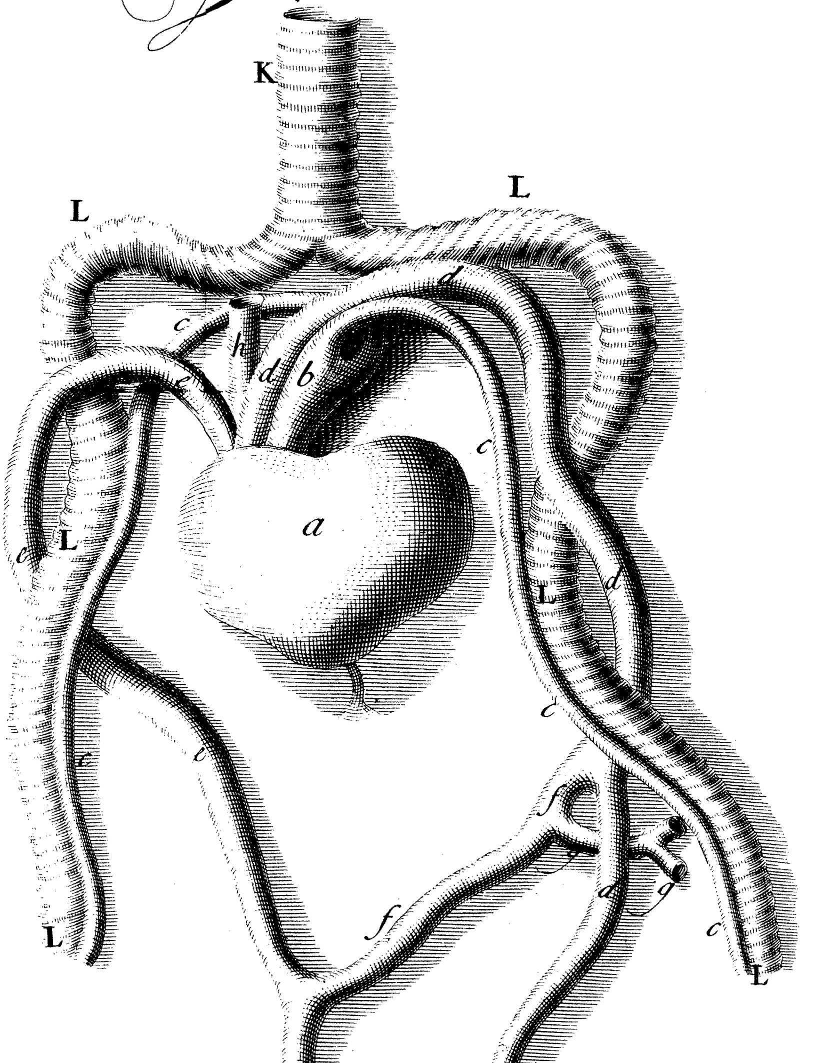
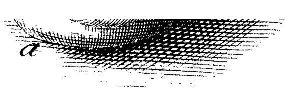


Fig: 4^{a}.

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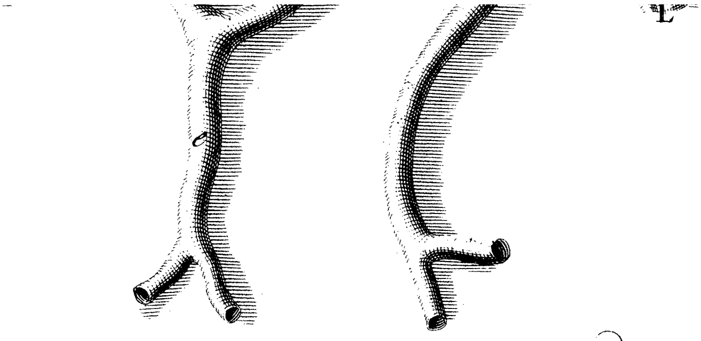


M: V.dr Gucht Scul:

Philoſoph: Tranſact: N° 328.

Fig: 1^{a}.

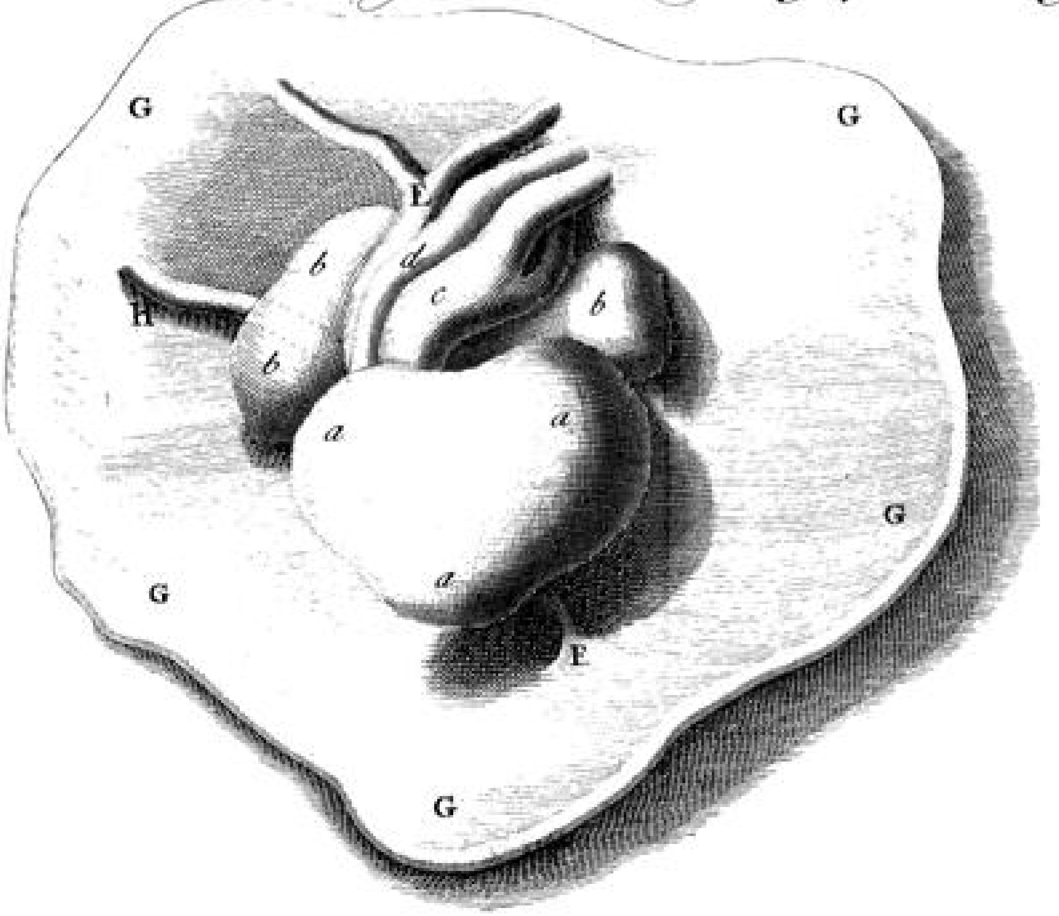


Fig: 3^{a}.

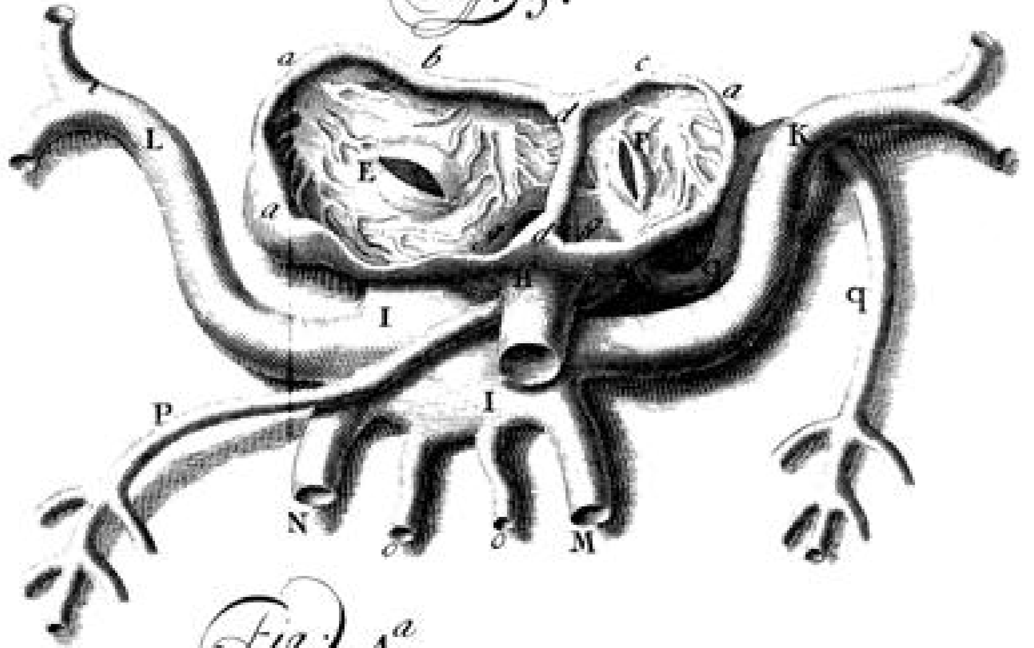


Fig: 2^{a}.

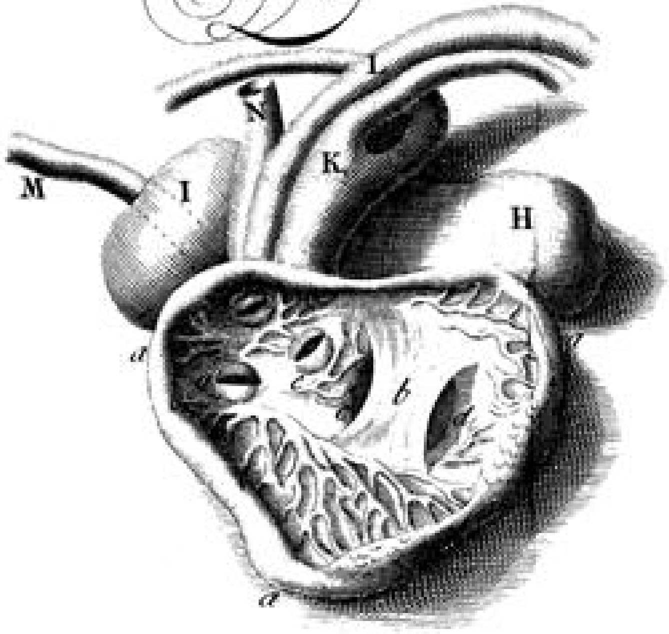
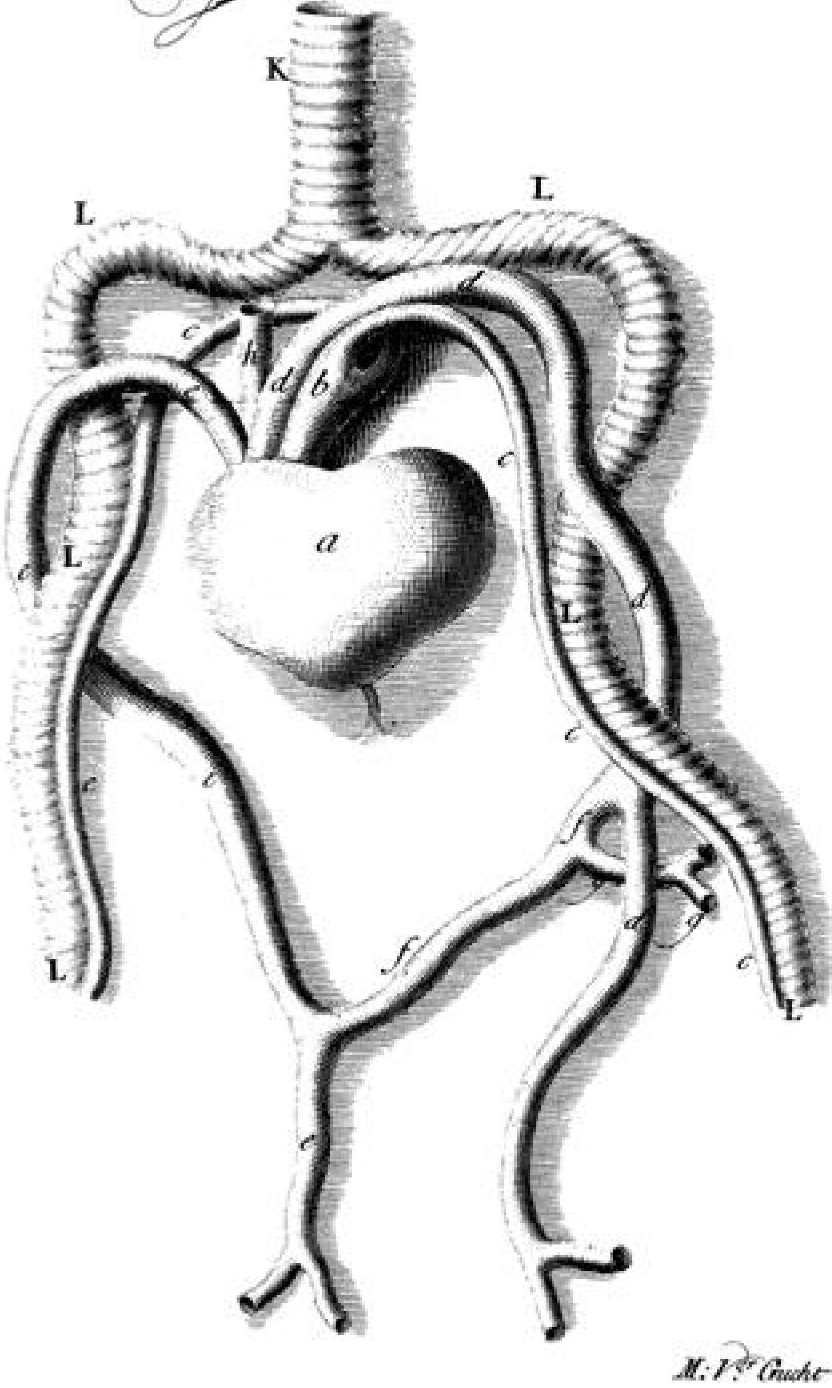


Fig: 4^{a}.



M: V^{d} Gucht Sculp.